

Acute Toxicity and Gastroprotection Studies of a New Schiff Base Derived Copper (II) Complex against Ethanol-Induced Acute Gastric Lesions in Rats

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BACKGROUND: Copper is an essential element in various metabolisms. The investigation was carried out to evaluate Acute gastroprotective effects of the Copper (II) complex against ethanol-induced superficial hemorrhagic mucosal lesions in rats.

METHODOLOGY/PRINCIPAL FINDINGS: Rats were divided into 7 groups. Groups 1 and 2 were orally administered with Tween 20 (10% v/v). Group 3 was orally administered with 20 mg/kg omeprazole (10% Tween 20). Groups 4-7 received 10, 20, 40, and 80 mg/kg of the complex (10% Tween 20), respectively. Tween 20 (10% v/v) was given orally to group 1 and absolute ethanol was given orally to groups 2-7, respectively. Rats were sacrificed after 1 h. Group 2 exhibited severe superficial hemorrhagic mucosal lesions. Gastric wall mucus was significantly preserved by the pre-treatment complex. The results showed a significant increase in glutathione (GSH), superoxide dismutase (SOD), nitric oxide (NO), and Prostaglandin E2 (PGE(2)) activities and a decrease in malondialdehyde (MDA) level. Histology showed marked reduction of hemorrhagic mucosal lesions in groups 4-7. Immunohistochemical staining showed up-regulation of Hsp70 and down-regulation of Bax proteins. PAS staining of groups 4-7 showed intense stain uptake of gastric mucosa. The Acute Toxicity revealed the non-toxic nature of the compound.

CONCLUSIONS/SIGNIFICANCE: The gastroprotective effect of the Copper (II) complex may possibly be due to preservation of gastric wall mucus; increase in PGE(2) synthesis; GSH, SOD, and NO up-regulation of Hsp70 protein; decrease in MDA level; and down-regulation of Bax protein.

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